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## PROBABLE SPAWNING SITE OF THE FRESHWATER COBBLER *TANDANUS BOSTOCKI* LOCATED IN THE MURRAY RIVER WESTERN AUSTRALIA

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### INTRODUCTION

The freshwater cobbler *Tandanus bostocki* is the largest indigenous inland species in south-western Australia, attaining a total length of at least 55 cm and a weight of at least 2.27 kg (Coy 1979). Morrison (1988 unpublished Ph D. thesis) studied the breeding biology of this species in Wungong Dam. Through use of gonadal-somatic indices, he was able to determine that spawning took place between November and January, but he did not observe the prespawning or spawning behaviour of this species or locate any spawning sites.

The related eastern Australian *T. tandanus* are known to spawn at water temperatures greater than 24°C, and temperature, rather than flooding

appears to be the primary factor stimulating spawning in these fish (Davis 1977). A nest is usually built by spawning *T. tandanus* in sand or gravel and may be up to 2000 mm in diameter (Lake 1978). It has been assumed that the spawning of *T. bostocki* would be similar to that of *T. tandanus* (Lake 1971). Merrick and Midgely (1981) described the prespawning and spawning behaviour of *T. tandanus* in Kingham Creek, Queensland.

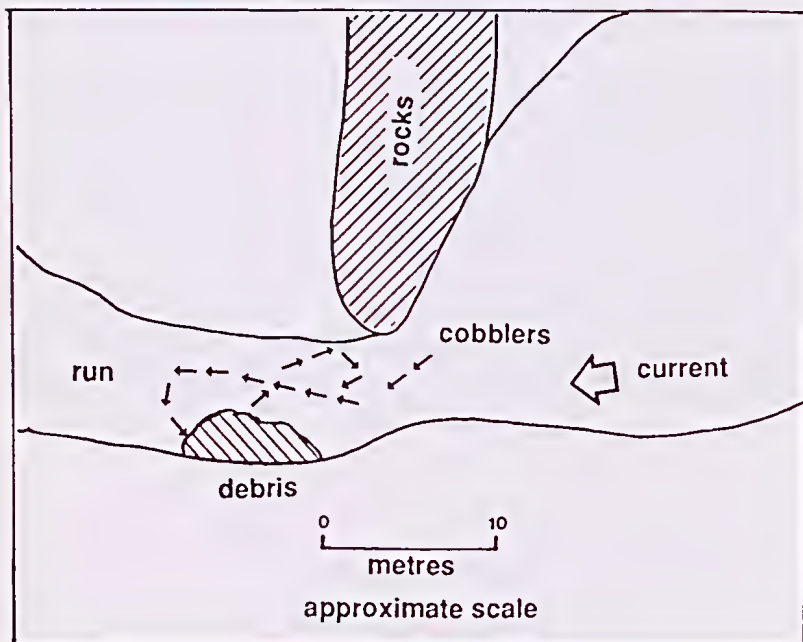


Figure 1: Movement of cobbles into run.

## OBSERVATIONS

On 15 December 1988, in a run at the exit of Scarp Pool (116°00'E 32°46'S) between 16.45 hr and 17.15 hr, observations were made of the following behaviour by *T. bostocki*. Approximately 20 cobbles of 20 to 40 cm in length were first observed drifting downstream from a pool into an 8 metre wide run, with a water depth between 40 and 70 cm. The water temperature was 24.0°C, and O<sub>2</sub> saturation was 92%\*. After drifting downstream the cobbles moved into some debris on one side of the run. Cobbles often left the cover of the debris, moved back to the head of the run, then repeated the above process (Figure 1).

Sometimes a fish drifting downstream was met by a cobbler from the debris (Figure 2) in what appeared to be an aggressive action, then nipped. After such an exchange both fish would retreat to the debris. On other occasions a fish drifting downstream from the head of the run would pair with a fish from the debris. Pairs would swim upstream about 3 or 4 metres, remaining in close

\* Measured with a TPS digital oxygen analyser.

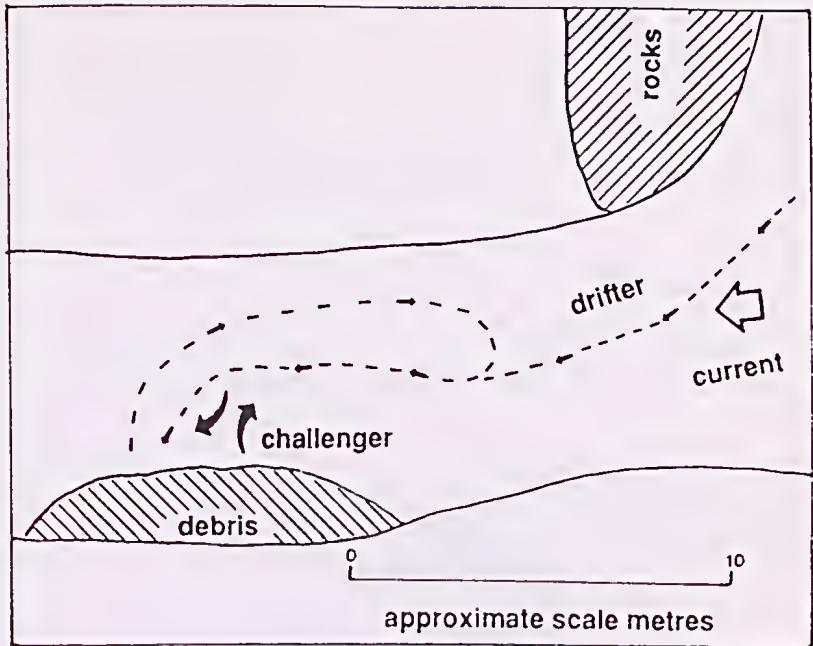


Figure 2: Typical movement of drifting cobbles and challenger.

contact. Sometimes a pair would move out from the debris and engage in the same behaviour. A third fish would occasionally attempt to join a pair. After swimming upstream paired fish were observed to simultaneously disturb the bottom substrate with their mouths, whilst beating their tails rapidly (Figures 3, 4A, B, and C).

Several colour slides were taken of the above behaviour, with a single lens reflex camera fitted with a 50 mm lens. However the lack of a polaroid filter, poor light and the distance of the fish from the observation point made these slides unsuitable for journal reproduction. For clarity the outlines of the fish were traced onto paper, from large projected images to produce Figures 4A, B and C.

On 19 November 1989 the same type of behaviour was observed again in the run. The behaviour was first observed upon arrival at the site at 09.30 hr and was still in progress at 16.30 hr, at which time, I had to leave. The water temperature at 09.30 was 21.3°C and oxygen saturation 93.4%. By 16.00 hr the water temperature had reached 23.7°C and oxygen saturation was 95%. These latter conditions are almost identical to those recorded at 16.45 hr 15 December 1988.

## DISCUSSION

The above behaviour was unusual in that it took place during daylight hours. Cobblers are a nocturnal species, and the above dates represent the only occasions, over a three year period during a wider study of the distribution of fishes of the Murray River system, that I observed cobblers active in the day, although I frequently observed them at night.

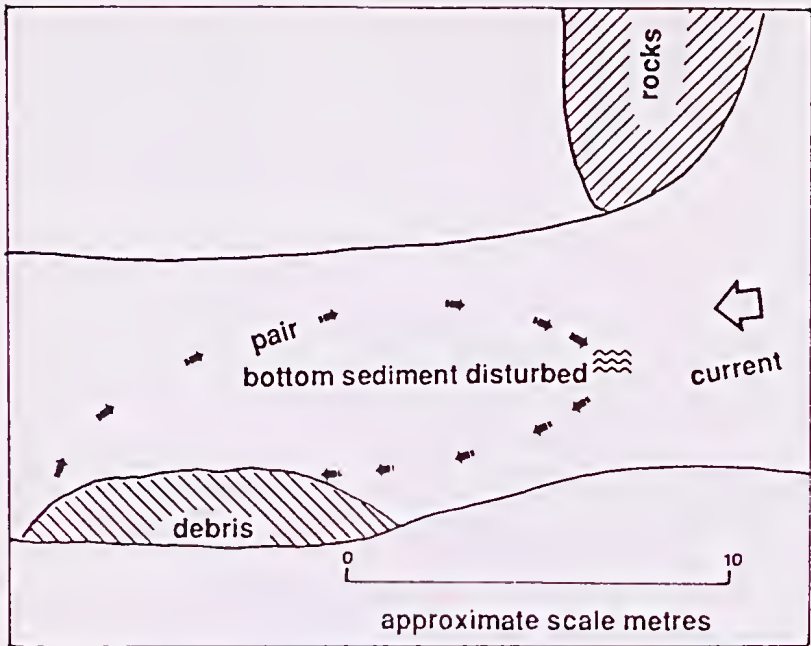


Figure 3: Typical movement of paired cobbles from the debris.

There are several reasons for suspecting that the above behaviour may have been related to spawning or pre-spawning activities. First the dates of the behaviour correspond with the spawning times determined by Morrison (1988). Second the water temperatures at the time were close to those reported for the spawning of *T. tandanus* by Davis (1977). Third, some aspects of the behaviour were similar to the description of the spawning behaviour of *T. tandanus* described by Merrick and Midgely (1981). For example Merrick and Midgely noted that prior to pairing, the female initially approached from deeper water upstream. This is similar to the observation of cobbles drifting from the head of the run just prior to pairing with another individual from the debris. The fish observed by Merrick and Midgely also swam in close contact as did the fish observed at Scarp Pool. Fourth, *T. tandanus* spawns during daylight hours (Merrick and Midgely 1981). However the descriptions of Merrick and Midgely involved only one pair, whilst my observations included at least 20 fish gathered in one place, and also included observations of what was thought to have been aggressive behaviour. Finally, small 3-4 cm cobbles began appearing in fish traps set in the Murray River between 4 and 9 February 1989, suggesting spawning had recently taken place.

### CONCLUSION

Unfortunately on both occasions when the above behaviour was observed, I was taken by surprise, and was not equipped for underwater observations, thus could not search for the presence of eggs. I also had limited time to make the observations, owing to other research commitments, thus at this stage one can only speculate that the observed behaviour was related to spawning.

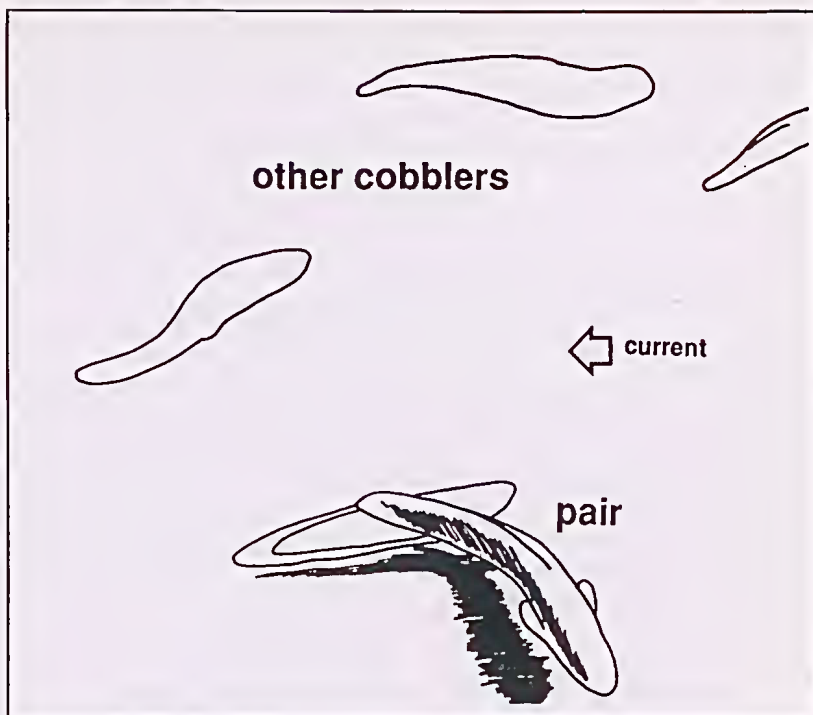


Figure 4A: Pair just formed.

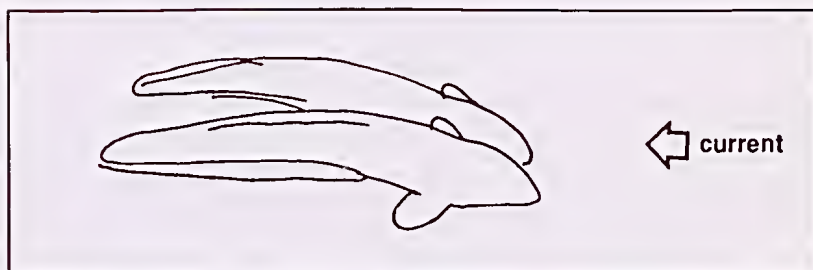


Figure 4B: Pair just prior to disturbing gravel.

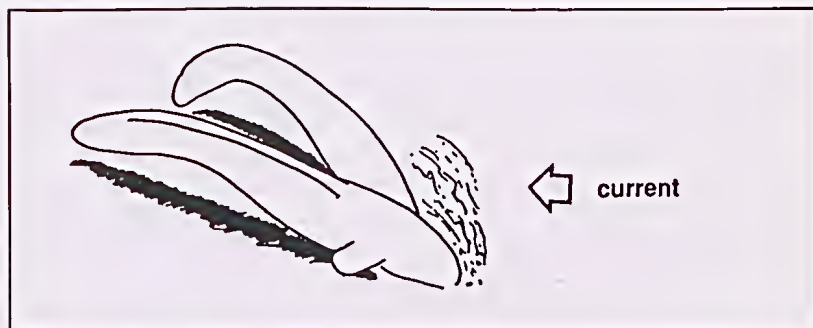


Figure 4C: Pair disturbing gravel.

Nevertheless, on the basis of the work by Morrison (1988) and what is known of the spawning behaviour of the related *T. tandanus*, I would suggest that the behaviour was related to spawning or pre-spawning activities. Scarp Pool is easily accessible, and I would recommend that it be used by any interested researcher as a site to study in more depth the behaviour of *T. bostocki*.

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### LONG-BILLED CORELLAS HAVE AN UNCERTAIN STATUS IN THE SOUTH-WEST OF WESTERN AUSTRALIA

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#### ABSTRACT

An accurate estimate of the number of birds comprising the population of Western Long-billed Corellas at Lake Muir was required to assess the potential for damage to grain crops and seedling trees. A ground-based count of corellas was carried out in May 1991 and two aerial surveys were flown in a Cessna 182 — the first in July 1990 and the second in March 1991. Approximately 1420 birds were counted during the ground-based survey and between 800 and 920 birds were observed during the aerial surveys. More population estimates are needed before firm conclusions can be made about the size and stability of the corella population. Poisoning and shooting campaigns for control of damage to agriculture have the potential to cause a rapid decrease in the corella population.

#### INTRODUCTION

The Western Long-billed Corella (*Cacatua pastinator pastinator*) (Ford 1985) is endemic to the south-west of Western Australia, where it occurs in populations centred around Moora/Dalwallinu and Lake Muir/Tonebridge. It was recently placed in Schedule 1 of the Rare and Endangered Species List by the Department of Conservation and Land Management (C.A.L.M.) (Western Australian Government Gazette, November 1990). Birds in the Lake Muir/Tonebridge population eat newly sown grain and destroy seedling trees and consequently are sometimes killed by landholders. In 1985 the population at Lake Muir/Tonebridge was reported to number approximately 3000 birds with flocks of up to 1000 observed at Dinninup and Orchid Valley (Storr 1991). [The northern population is estimated to number